BIOS 310 Syllabus and Course Policy — Spring 2022

Please share this document with your research professor (PI) and your mentor at the bench.

BIOS 310 Instructor: Dr. Dereth Phillips (derethp@rice.edu) serves as a general resource for all BIOS 310 students and as the on-campus advisor/instructor of record for all off-campus Texas Medical Center research. If your research takes place in a Rice University lab, your Biosciences department professor or sponsoring professor will be your instructor of record for the course.

Office Hours (Dr. Phillips): Zoom office hours are usually scheduled for Mondays 1:30-2:30, Tuesday 4-5, Friday 3-4:30 pm. Office hours may change based on student time preference and additional times may be available. Sign up for an office hours slot on Google Calendar using the url: https://tinyurl.com/yclvc2gd . Appointment times will disappear from the calendar when they have been claimed or if they have not been claimed with at least an hour's notice. If you are unable to find a time, email Dr. Phillips.

All Students are Welcome Here

Students in BIOS 310 will work hard, engage intellectually, and ultimately grow as colleagues and scientists. Research may be challenging but it should be accessible to all Rice Undergraduates. If, for whatever reason, you are facing barriers as you seek or engage in research, let us know. If participation in research conflicts with a paying job and would leave you in financial hardship, let us know. If your research is distant from your apartment or residence hall and travel has caused a financial or temporal hardship or a safety hazard, let us know. If you are feeling unwelcome or unsafe in your lab, for whatever reason, let us know. Science only moves forward if a diversity of minds bring varied viewpoints and experiences to bear on a problem. By letting us know of barriers, you can help us to make science accessible and welcoming for all Rice students. We have many resources on campus but you are welcome to start by contacting me (derethp@rice.edu) and I can listen and help you to navigate your resources.

Course objectives and expected learning outcomes

Upon completion of this independent mentored research experience and related course requirements, students should be able to:

- Describe the state of current scientific knowledge and identify the key questions in a focused area of biological or biomedical research (supported by critical reading of primary scientific literature in the field)
- Perform relevant current research methodologies with an awareness of the advantages and limitations of each in the context of the questions being addressed.
- Design experiments with appropriate positive and negative controls
- Identify and troubleshoot problems encountered when performing protocols
- Analyze data collected and identify the relevance of findings to the scientific problem at hand
- Effectively communicate their research through genres commonly used by scientists (e.g. proposal, research article, or poster)

General Requirements for BIOS 310 Course Credit

BIOS 310 students perform research in the laboratory of a faculty member in the Biosciences Department at Rice University (sections 2 and above) or with off-campus faculty elsewhere in Texas Medical Center laboratories or area field sites (section 1). To receive credit, a student must participate in a laboratory-, field- or bioinformatics-based biosciences research project. Students are required to spend 42 hours of research per credit (e.g. 126 hours total for 3 credits). Hours should be recorded on your **time sheet**. In addition to **lab research**, **record keeping** (lab notebook), and **regular reading of relevant primary literature**, students will prepare the required written assignments listed below.

- **Research proposal:** Prepare a 1-page research project proposal containing an abstract that summarizes the basis of the planned project, experimental aims for the semester, and references. Develop this proposal in consultation with your professor and submit it to all of your advisors (professor/PI, bench mentor, and the BIOS 310 instructor at bios310-submissions@rice.edu, if your lab is off-campus) and upload to Canvas before the end of the second week of classes. One purpose of this research proposal is to help you to secure concrete guidance early. Your deadline to submit this document gives your professor a deadline to provide you with input.
- **Lab Notebook:** Keep a detailed lab notebook on a daily basis when in the lab or performing research remotely. Notebooks can be either paper or electronic and students should consult their research professors for the preferred documentation method. Notebooks will be left with the lab at the end of the course and are the property of the hosting lab.
- **Weekly progress reports:** Send weekly email progress reports to your professor and your research mentor; off-campus research students (section 001) will submit their reports through an on-line Google-form system. This weekly email report will include: hours in lab that week, experiments conducted, results obtained, conclusions drawn, plans for the following week, and literature read. These reports will be due by the end of each week. Please consult the Writing an Effective Weekly Report page in Canvas for the suggested format or you may use the weekly report Google form: https://forms.gle/kmF2vLWwJXQf89RF8. *Students researching off-campus are required to use the Google form.*
- **Preparatory activities and drafts:** Complete the preparatory and draft exercises indicated in the "Schedule and deadlines" below and in your Canvas assignments. These exercises will ensure that you have the time and feedback you need to produce high-quality final projects.
- **Final project:**
    - ***Research paper:*** All first-time BIOS 310 students will write a paper in the style of a peer-reviewed scientific article. This is the only final-project option for first-semester BIOS 310 students.
    - ***Poster presentation:*** Returning BIOS 310 students who have already written a BIOS 310 paper are expected to prepare and present a poster at either RURS (spring semester) or the IBB Summer Research Symposium (summer term). If you are a returning BIOS 310 student, talk to your professors/PIs now about the poster expectation as some projects may be governed by non-disclosure agreements (NDAs). Adjustments to final projects can be made (e.g. using aliases for gene names) if presentation of research would violate NDAs.
- See the 'Schedule and Deadlines' below for the relevant deadlines for the current semester. Detailed instructions for assignments and preparatory activities will be available on the BIOS 310 Canvas course site. Individual professors may impose additional requirements, such as a presentation at lab meeting, and should inform students of these additional requirements and associated due dates by the end of the second week.

Grading Policy

Grades will be determined by performance in research and on written assignments. Strong performance in these areas requires intellectual engagement and regular reading of the scientific literature in addition to careful execution of experiments. Students in on-campus Biosciences labs will be evaluated directly by their research professors (PIs) while those in off-campus labs or out-of-department labs will be evaluated by their research professors with input from their BIOS 310 section instructor. A detailed list of questions from the evaluation form may be found in the Canvas module, "How am I doing? A midterm self-check."

- Research/lab performance
    - 65%, lab citizenship, performance in lab/field/bioinformatics research, record-keeping (lab notebook), scientific-literature reading
- Written/oral communication 35%*
    - 5% proposal

- 14% weekly reports
- 4% required preparatory activities (paper/poster drafts with literature references)
- 12% final paper or poster (returning 310 students)

*Students in section 001 (off-campus research) will be evaluated primarily by their research professor/PI but the section instructor will ensure completion of all communication assignments. Off-campus professors may not waive any of the BIOS 310 communication assignments/requirements.

Late work policy: The late work policy is to promote continued forward momentum in your research and writing. Weekly reports are due at the end of each week of class (by Sat. 11:59pm). Reports submitted later than the following Monday will be counted as missing (0). All other required assignments will drop 10% every day late.

Schedule and Deadlines

All written materials (student agreement form, proposal abstract, weekly reports, paper/poster drafts and final paper/poster) must be submitted to your **research professor/PI*** and copied to your **mentor at the bench***. If you are in the off-campus section (section 1) you will submit weekly reports via the weekly report Google form (https://forms.gle/kmF2vLWwJXQf89RF8) and copy the bios310-submissions@rice.edu email when you send proposals and papers to your advisors. All submission deadline times are 11:59 pm unless otherwise stated. **The people receiving copies of your work will be called collectively, '**your advisors,**' for the purpose of the course deadlines*.

Deadlines—deadlines for specific groups are color-coded as follows:

PAPER-writers, **POSTER-presenters**, **EVERYONE**

Due Date	**Assignment**
Daily	Enter your daily progress into your **lab notebook** (paper or electronic). Leave this in the lab. Ask your lab if they have a preferred format. Throughout the course you are responsible for **reviewing the educational materials** found in the Canvas course modules.
Every week by Saturday, 11:59pm	Email **weekly reports** to your advisors (see above for definition of "advisor"). Off-campus researchers use the google weekly report form. **Record your research hours** on your **time sheets**. Collect and add relevant articles to your **citation manager library** (e.g. Zotero).
January 22, 2022 Week 2	Email **1-page proposal** (abstract, aims, and references) to your advisors and upload to Canvas. Prior to this final submission, you should have reviewed this document with your research professor and mentor at the bench to ensure that you understand the scope of the project you've been assigned. Share and upload a photo of a signed copy of your **agreement form (syllabus acknowledgement)**, found on the last page of this syllabus.
TBA Look for deadlines on the OURI RURS page	Poster-presenters: submit RURS **abstract** and registration. Ensure that your professor reads and approves your abstract before submission. See RURS

	website for more information (https://ouri.rice.edu/rice-undergraduate-research-symposium).
February 19, 2022 Week 6	**Mid-term check-in:** Seek feedback from your research professor on your performance and scientific development and set goals for the remainder of the term. Discuss upcoming communication assignments.
March 12, 2022 Week 8	Submit a draft of the **methods section** of your paper to Canvas and to your advisors for feedback. Submit the first draft of your "**poster-preparation slide deck"** with an outline of the content types that will go on your poster (headings and bullet lists). Flesh out your "approach" slide by creating a visual (illustration/schematic/flow diagram) that describes your methods.
March 26, 2022 Week 10	Submit an **outline of your paper** (with citations) to Canvas and your advisors for feedback. **Use your citation manager library** to insert citations for each of the points or moves in your outline requiring references. Auto-generate a bibliography using your citation manager—do not cut and paste references into your bibliography. You are encouraged to begin writing your Introduction now as this will likely be the most time-consuming portion of the writing process. Submit a second draft of your "**poster-preparation slide deck"** to Canvas and to your advisors for feedback. This version should have visual elements as well as brief text.
April 2, 2022 Week 11	Submit **draft #1 of your poster** to Canvas and to your advisors for feedback and approval. It is critical to ensure that all of the authors (esp. your PI and mentor) are able to review the written and oral portions of your poster presentation before you present it publicly. You will be representing your lab in a public venue!
April 9, 2022 Week 12	Submit **draft #1 of your paper** to Canvas and to your advisors for feedback (paper draft must have at least a complete Introduction and Methods with references). Submit **draft #2 of your poster** to your advisors for the final round of feedback and prepare to print for RURS. Plan and practice the script for your presentation with your lab.
April 15, 2022 (Friday) Week 13	**Present your poster** at the Rice Undergraduate Research Symposium. Details will be released on the following page: https://ouri.rice.edu/rurs. **Attend RURS** to support your fellow BIOS 310 presenters
April 16, 2022 (Sat.) Week 13	upload your final **poster file** and a **recording of your presentation** to Canvas (Zoom recording is fine). Share these documents with your advisors.

April 22, 2022 Week 14 *(due Friday but you can have an automatic extension to Saturday)*	Submit **draft #2** of **paper** to Canvas and to your advisors for feedback (draft must contain all parts of the paper, including Abstract, Results and Discussion). *Remember that timely draft submission is not only a requirement but also a courtesy to give your professor ample time to give feedback.*
May 3, 2022 End of finals (or sooner)	**All students:** email a copy of your **time sheet** to your advisors and upload a copy to Canvas, Leave your **notebooks** with the lab. Submit **final version of your paper** to advisors and upload to Canvas.

Honor Code for BIOS 310

Honorable conduct: Students are responsible for maintaining the highest standards of honesty and integrity in their work and conduct. As you are enrolled in this course, the spirit and relevant provisions of the Rice Honor Code extend to all parts of this course, including your conduct in the laboratory.

Responsible documentation and reporting: Students must properly and regularly document their research in a paper or electronic lab notebook and accurately represent this research in course papers or publications. If you are concerned that others may be fabricating or falsifying data, share your concerns with your professor, the BIOS 310 Instructor, another faculty member, the department chair, or the department ombudsperson.

Guidelines for collaboration with colleagues: As research is a collaborative effort, you are expected to communicate with and receive input from others. While the work reported in your written materials should be your own, you may include data and figures produced by other members of your lab as background if they are relevant to your conclusions about your own research and are properly attributed to the individual(s) who produced them. Although many of the projects in a lab originate from a common starting point, your proposal, papers, posters, etc. should be your own work in your own words and not copied (plagiarized) from existing lab documents.

Guidelines for proper citation of written work: Plagiarism is a form of academic fraud and is a violation of the Rice Honor Code. Forms of plagiarism include: copying a source word-for-word, inadequate paraphrasing without proper acknowledgement, and claiming another's ideas as one's own. BIOS 310 students are required to educate themselves in the use of proper citations in their written work by reading the following three sources:

- the Rice Honor Code information on Academic Fraud and Acknowledgement of Sources: http://honor.rice.edu/honor-system-handbook/
- the documents, "Recognizing and Avoiding Plagiarism" by Dr. Janice L. Hewitt, and the document, "How not to plagiarize," written by Dr. Richard Gomer, both found in the BIOS 310 Canvas module on Writing a Research Paper under the heading "Responsible attribution."

Avoiding Multiple submission: "Multiple submission is the resubmission of any work by a student that has been used in identical or similar form in fulfillment of any academic requirement at this or another institution. Under certain conditions a student may be permitted to rewrite an earlier work or to satisfy two academic requirements by producing a single piece of work, more extensive than that which would satisfy either requirement on its own. In such cases, however, the student must secure prior permission from each instructor involved. If the student has revised an earlier essay, the earlier essay should be submitted with the final version. If a single extended essay has been written for more than one course, the fact must be clearly indicated at the beginning of the essay. Thus, submitting the same work for credit in more than one class, either concurrently or consecutively, without prior permission from the professor

shall be considered academic fraud." from *Academic Fraud and the Honor System*, http://honor.rice.edu/honor-system-handbook/

Disability support

Guidelines for students with disabilities: If you have a documented disability that will impact your work in this class, you should do the following. 1) Make sure this documentation is on file with Disability Resource Center (Allen Center, Room 111 / adarice@rice.edu / 713-348-5841) as this will determine the accommodations you will need. A DRC advisor will assist you in preparing an accommodation letter to give to your professors. 2) Meet with your professor (and the BIOS 310 instructor if you are off campus) in the first two weeks of class to share the letter and discuss your accommodation needs. If you require refinement of your accommodations during the semester, please do not hesitate to contact your professor. All discussions will remain confidential. For more information visit the Rice Disability Resource Center site (https://drc.rice.edu/).

See Agreement form on next page➔

Student Agreement Form (syllabus acknowledgement)

Over the course of the semester, we expect that BIOS 310 students will:

1. spend *at least* 42 hours per credit researching in the lab or remotely over the course of the semester (e.g. 126 hours for 3 credits or 168 hours for 4 credits) and register hours on their timesheets.
2. be intellectually engaged in their research
3. be familiar with the relevant research (read primary research articles and confer with researchers)
4. understand the larger context of their work
5. perform experiments carefully and with an attention to detail
6. keep a detailed notebook (paper or electronic)
7. be responsible with lab reagents, equipment, and data
8. keep a regular research schedule and inform their professor and bench mentor prior to an absence or vacation
9. be on time for meetings and experiments
10. work well with and be respectful of their mentors and other lab colleagues
11. complete clear and detailed weekly reports by Saturday night of each week
12. complete a thoughtful proposal abstract by the end of the second week of classes
13. submit multiple drafts of their final papers or posters (see preparatory assignments)
14. present their research and research findings clearly and effectively in a final research paper or poster presentation (poster is for spring or summer semester students with previous BIOS 310 experience)
15. properly cite all contributions by others (published and unpublished) in all of their written work for this course, in accordance with course policies regarding plagiarism
16. create and share drafts with their research professor and mentor, giving them an opportunity to suggest edits and approve documents, prior to submission of any final copy of proposals, papers or posters (weekly reports do not have to be shared prior to submission)
17. ask for clarification from their professor (PI), mentor, and course instructor if they are unsure of any of their lab protocols or course expectations
18. be free of all conflicts of interest with their hosting lab (e.g., advisors must not be family or friends, family must not have a financial stake in your research)
19. familiarize themselves with the content of the BIOS 310 Canvas site which will provide additional informational modules with assignments and rubrics.

I have read the entirety of this BIOS 310 Syllabus and Course Policy document and understand the requirements of this course.

_____ _____

Student Name Date

Share a signed copy (photo or pdf) of this page with your research professor (PI) and bench mentor and upload it to the BIOS 310 Canvas site as well.